

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
15 September 2005 (15.09.2005)

PCT

(10) International Publication Number  
**WO 2005/086332 A1**

- (51) International Patent Classification<sup>7</sup>: H02M 3/157      (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (21) International Application Number:  
PCT/KR2005/000331
- (22) International Filing Date: 4 February 2005 (04.02.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
10-2004-0015559      8 March 2004 (08.03.2004) KR
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- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2005/086332 A1

- (54) Title: DIGITAL DC-DC CONVERTER USING DIGITAL MODULATION

(57) Abstract: A digital DC-DC converter is implemented using first-order delta-sigma modulation, rather than A/D conversion. In the DC-DC converter, a PWM generator 210 converts an input DC voltage to a preset level DC voltage according to an input PWM signal. A converter 220 converts the DC voltage from the PWM generator 210 to a preset level voltage. A delta-sigma modulator 230 converts a feedback voltage Vfd corresponding to the output voltage Vout of the converter 220 to a 1-bit digital voltage Vo according to a preset reference voltage Vref. A counter 240 counts logic 1's in 1-bit digital voltage signals Vo from the delta-sigma modulator 230. A delay controller 250 controls a high-level delay time according to the number of logic 1's counted by the counter 240 and transfers a PWM signal having the controlled high-level delay time to the PWM generator 210.